DOCUMENT RESUME

ED 251 963 EA 017 374

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TITLE Research Issues in the Economics of Education and Growth. Occasional Papers in Educational Policy Analysis: Paper No. 409.
INSTITUTION Southeastern Regional Council for Educational Improvement, Research Triangle Park, N.C.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Sep 84
NOTE 47p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Cost Effectiveness; *Economic Factors; Economic Progress; Economics Education; Educational Administration; *Educational Economics; Educational Equity (Finance); *Educational Policy; Educational Supply; Efficiency; Elementary Secondary Education; Financial Support; Labor Force Development; Politics of Education; *Productivity; Resource Allocation; Vocational Education
IDENTIFIERS *United States (Southeast)

ABSTRACT

This report discusses diverse economic issues involved in educational reforms aimed at improving economic growth. The focus is on elementary and secondary education in the southeastern United States. After a general overview of the economics of educational reform, section I discusses the issues involved in modeling and estimating the linkages between education and growth. Section II examines the financial implications of commitments to "equity" in educational reform. Section III discusses specific policy areas with an emphasis on assessing cost effectiveness. Issues discussed include "the basics," vocational education, counseling, economics education, and faculty and administrative inputs. The broad objective of this report is to provide an appreciation of the research agenda in economics that is necessary to undergird informed educational policy for economic growth in the decades ahead. A summary of this agenda appears in section IV, and a three-page bibliography is included. (TE)

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SEPTEMBER 1984

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EA 017 374

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The activity which is the subject of this paper was supported in whole or in part by the National Institute of Education, Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

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RESEARCH ISSUES IN THE ECONOMICS OF EDUCATION AND GROWTH

Economic growth and public education are two areas which in recent years have been the objects of increasing interest and concern. From the standpoint of economic growth, the decade of the 70s brought some alarming developments. Adverse supply shocks, declining productivity, and intense international competition combined to foster a new awareness and advocacy with respect to strategies for economic growth. Over roughly the same period, observers of our educational process cited mounting evidence of the gradual deterioration in the quality of public schools. In 1983 the President's own blue-ribbon committee lent its official determination that, from an educational standpoint, we are indeed a "nation at risk." The national reaction to this report has been dramatic, swift, and still growing.[1] In short, it seems clear that in the decade of the 80s the issues of economic growth and public education will remain at the top of the political agendas on the national, state, and local levels.

The purpose of this report is to provide policymakers in education with an understanding of economic issues that are implied by educational reforms aimed at improving economic growth. The focus is limited to elements of public education at the primary and secondary levels and

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[1] An interesting compilation of state-by-state initiatives that have been taken since the Commission's report is "The Nation Responds: Recent Efforts to Improve Education." Department of Education, Washington, D.C. 1984.

growth with regard for the economic circumstances of the southeastern United States.

In the context of recent history, yet another study of educational reform must seem stale, if not self-flagellating. In the last two years there have appeared no less than ten major reports providing diagnoses and prescriptions for an educational system which is widely perceived to be ailing.[2] At the risk of oversimplification, it is fair to say that these reports are more notable for their similarities than differences, although the latter clearly exist.[3] There is virtual unanimity regarding curricular changes: strengthened core of language, math, and science; elevation and standardization of achievement; and a deemphasis of vocational programs. General mention of computers, both in curriculum and teaching, is common, although clear notions of implementation are rare. There is also concern regarding the competence, salaries, and prestige of the teaching profession. Finally, there is general agreement that several strata -- federal, state, and local government as well as the business community -- have an appropriate and vital role in raising the quality of public education. Combined, the observations and recommendations of these studies reflect an impressive and diverse collection of field research, professional experience, and personal philosophies on public education.

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[2]The ten studies are denoted by an asterisk in the bibliographical section of this paper.

[3]For a good overview of the substance of these publications, see "A Summary of Major Reports on Education." Education Commission of the States. Denver, November, 1983.

Considered from an economic perspective, the recent educational reform proposals lend themselves to a different, surer, and more critical style of generalization. To the economist, three broad aspects of the educational reform literature stand out. First, most of these studies open with either an implicit or explicit allusion to the critical nexus between education and economic growth. This association is a safe, casual one to draw. Nevertheless, despite a large literature on the subject, economists know too little about the precise linkages between education and growth even to pretend to engineer educational policies aimed specifically at growth. Second, there is unanimity that educational reform be equitable, as well as a broad perception that society is willing to make the financial commitment necessary. However, there is no analysis, indeed little acknowledgement, that the commitment to equity in educational reform may carry some potentially awesome financial implications for federal, state, and local authorities.[4] Third, in the all too probable event that resources are not as plentiful as the current "honeymoon" euphoria for reform seems to infer, the need arises for narrowing the list of "musts." Choices among programs must be based, if not exclusively, at least partially upon "efficiency" considerations. Efforts to set priorities for specific reforms require analyses of their cost effectiveness.

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[4]One recent estimate by the American Association of School Administrators indicates that implementation of all of the proposals in "A Nation at Risk" would require, on average, a 21 percent increase in school budgets nationwide. Furthermore, inferences from data reported in Section I of this report suggest that the necessary increase would be even greater for the Southeast in general.

The broad outline of the paper reflects the general criticism noted above. Section I discusses the issues involved in modeling and estimating the linkages between education and growth. Section II examines the financial implications of commitments to "equity" in educational reform. Section III discusses some specific policy areas with an emphasis on assessing cost effectiveness. Our broad objective is to offer noneconomists, and educators in particular, an appreciation of the research agenda in economics that is necessary to undergird informed educational policy for economic growth in the decades ahead. A summary of this agenda appears in Section IV.

I. PERSPECTIVES ON THE THEORY OF EDUCATION AND GROWTH

As a factual matter, per capita income in the United States has risen secularly with remarkable consistency. And intuitively speaking, such growth would seem to stem from a better work force equipped with better machinery, both of which can be viewed as the culminating product of education. These advances underlie the widely held association between education and economic growth. Moreover, there exists an entire subliterature in Economics which attempts to quantify the contribution of education to economic growth. The progenitors of this literature are the classic studies by Denison and Schultz.[5] These studies carefully measure the quantities of labor and capital over time. Finding the

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[5]Edward F. Denison, Accounting for United States Economic Growth
(Footnote Continued)

growth rates of these physical inputs to be inadequate in explaining output growth fully, they look to some other force by which the books of growth accounting may be balanced. This force must be one relating to the quality rather than quantity of productive inputs. Thus growth stems from knowledge, or invention, or technology, or something -- all of which are the undeniable products of educated people.

From this type of empirical work flows the confidence, indeed the mandate, that we as a society must spend more to improve our educational system. There is, however, a vital link missing for educational policymakers. Measuring the contribution of education as that residual of growth which is inexplicable otherwise is merely a way of admiring the product of the past, while imparting little knowledge of the process that brought it about or how that process might be made more efficient. We observe the fact of growth and justly presume education plays an integral part, but we learn little from this evidence about the interplay of parts in the economic and educational machines that are responsible for growth. In sum, we as economists know little about the precise linkages between growth and the deliberate educational efforts that can foster it. Policy may have to proceed from hunches, albeit good ones, and proceed gingerly.

It is clear that we will not achieve in this report what the economics profession has not. Nevertheless, the remainder of this section presents some statistical overviews which are at least suggestive

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(Footnote Continued)
1929-1969, (Washington, D.C.: The Brookings Institution, 1974).
T.W. Schultz, "Education and Economic Growth," Social Forces Influencing American Education, ed. N.B Henry. (Chicago: University of Chicago Press, 1961), pp. 46-88.

of the direction in which a theoretical modeling with educational policy emphasis might proceed.

First, of a purely descriptive nature, Table 1 presents summary statistics for educational attainment, expenditure, and economic characteristics by region. Viewed broadly, the table reveals that the Southeast is uniformly lagging in all three areas, dramatically so in many series. The story that unfolds from a more detailed look is an interesting one. With only 57 percent of the adult population completing high school, the Southeast is about 16 percent below the Northeast and North Central regions and 23 percent below the West region. However, with respect to economic growth, the more relevant generation is still in school. There the situation is improving. Eighty-three percent of current 16-19 year-olds are still in school or have already graduated. Furthermore, the gap between the Southeast and the rest of the country is closing -- this figure lies only 7 percent below the Northeast and North Central and 3 percent below the West regions.

If educational attainment measures the quantity of education, educational expenditure is often taken to measure quality. In this regard, the Southeast ranks a distant fourth with a per pupil annual expenditure of $1,400.[6] At first blush, this would seem to reflect a

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[6]These results must be qualified by the existence of cost-of-living differences between regions and even states. Unfortunately, cost-of-living indices are not available by state. Regional approximations could be constructed from major metropolitan indices; however, it is our opinion that these might be misleading. We believe that while the Southeast likely has a lower cost of living, accounting for it would mute the differences, but not eliminate them.

Table 1

Educational and Economic Characteristics:
Means by Region[a]

	Southeast	Northeast	North Central	West
Educational Attainment				
Median school years completed	12.2	12.5	12.5	12.6
% of age 16-19 in school or no high school diploma	83.1	89.2	89.5	85.6
% of population 25 yrs. & older with high school diploma	57.0	68.2	68.9	74.2
% of population 25 yrs. & older with college degree	13.2	17.8	14.8	18.2
Educational Expenditure				
Student-to-teacher ratio[b]	12.5	10.6	11.8	12.4
Per pupil K-12 expenditure[b]	$ 1,399	$ 2,110	$ 1,807	$ 1,772
K-12 expenditure as a % of state income[c]	4.1	4.9	4.7	4.5
Economic Characteristics				
Per capita income	$ 6,218	$ 7,293	$ 7,111	$ 7,507
Median family income	$16,866	$20,352	$20,006	$20,574
% of population in poverty	16.9	10.6	11.0	11.6
Unemployment rate	6.6	6.2	6.3	6.3

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a All data pertain to 1979 with the exception of the median number of school years completed (1976). 1979 was selected to conform to the 1980 Census. Regional means are statistically different at the 1% significance level in all series except for "K-12 expenditure as a % of state income" and the unemployment rate.

b Data were unavailable for Alaska, California, Florida, Georgia, Indiana, and Wisconsin.

c Data were unavailable for Alaska, Georgia, Indiana, and Wisconsin.

lack of sacrifice or commitment to primary and secondary education on the part of these states. Closer inspection reveals, however, that as a share of total state income, the Southeast's 4 percent figure is not statistically different from the remaining regions. The hard truth is that while the people of the Southeast are apparently willing to make approximately the same proportionate sacrifice for the education of their children, their lower per capita incomes translate to substantially lower per pupil expenditures. Indeed, to achieve the same $2,100 per pupil expenditure of the northeastern states, southeastern states would have to devote 5.1 percent of their income, compared with 4.9 percent in the Northeast. In sum, the relationship between education and economic growth seems to be a two-way street. The acknowledged relationship is that education is necessary for economic growth. This table highlights an alternative view -- economic well-being may well be necessary for educational growth.

The economic characteristics of the four regions provide equally dramatic contrasts. Again, the Southeast lags substantially. Compare the Southeast with the West, which is the leader in most economic categories. Per capita income at $6,218 is 17 percent lower in the Southeast; median family income at $16,866 is 18 percent lower; and the percent of the population in poverty at 16.9 percent is 46 percent higher. These figures imply that not only are families in the Southeast less well off on average, but also that income is distributed much more unequally between families. The importance of this latter observation from an educational perspective pertains to its revenue implications. The traditional source of revenue for education is the property tax, deemed to be regressive by economists. Since property tax rates are

constant across all levels of property value and since the poor pay a larger share of their income for housing, the poor will pay a larger share of their income in property tax (either directly on property owned or through their rent) than will the rich. The comments of the previous paragraph are even more striking with this in mind. With lower average income and many more people in poverty, financing additional educational expenditures through a regressive tax may prove more than the state economy can bear. Alternative revenue sources must be explored. This issue is discussed in more detail in Section II.

The information in Table 1 introduces many of the issues in the relationships between education and economic growth as they pertain to the southeastern states. To summarize: (1) the current work force has noticeably lower educational credentials; (2) this gap is closing rapidly for the current generation of students; (3) to the extent educational quality is measured by per pupil expenditure, the Southeast remains far behind the remaining regions; (4) this expenditure gap is more the legacy of lower funding capacity than of commitment to education; and (5) closing the expenditure gap through increases in property taxes at the local level is likely to be impossible.

A slightly more detailed view of the likely causative relationship between education and growth can be gleaned from examining an occupational cross section of the regional work forces. That is, interregional differences in per capita income can be the result of either or both of two factors -- differences in wage and salary levels and differences in the distribution of the work force between low- and high-paying occupations. While data for the former are difficult to

find at the appropriate level of decomposition, occupational data are available by state. A priori, we would expect a positive association between education, income, and occupational standing. Figure 1 presents a pie chart for each of the four regions of the United States. Reading clockwise (beginning from roughly three o'clock), work-force shares are presented for six occupational categories in roughly ascending order of income and status, beginning with unskilled labor and moving up through managerial and professional occupations.

Generally, these occupational breakdowns conform to the educational attainment and income situation portrayed in Table 1. First, observe that the Southeast has the highest percent of its work force engaged in both skilled and unskilled employment. Indeed, the fraction of unskilled labor is markedly higher than all other regions, and especially compared to the higher income West, 22.2 versus 14.5 percent. Consistently, the Southeast also has the lowest proportion of its labor force in the more remunerative managerial and profession ranks, only 20.2 percent. Again, the disparity vis-a-vis either the Northeast or West is quite large, with 24.1 and 23.5 percent respectively in these regions. Though these figures may not be all that surprising to educators close to the situation of the Southeast, the implicatons are nevertheless worth stressing. While the Southeast may pay lower wages than other more unionized regions, the structure of the economy would dictate lower per capita incomes even at the same wage rates. And a growing region, defined as such by per capita income, appears to reflect an occupational cycle which requires a rising minimum level of education. It is thus the job of economic research to delineate more clearly the

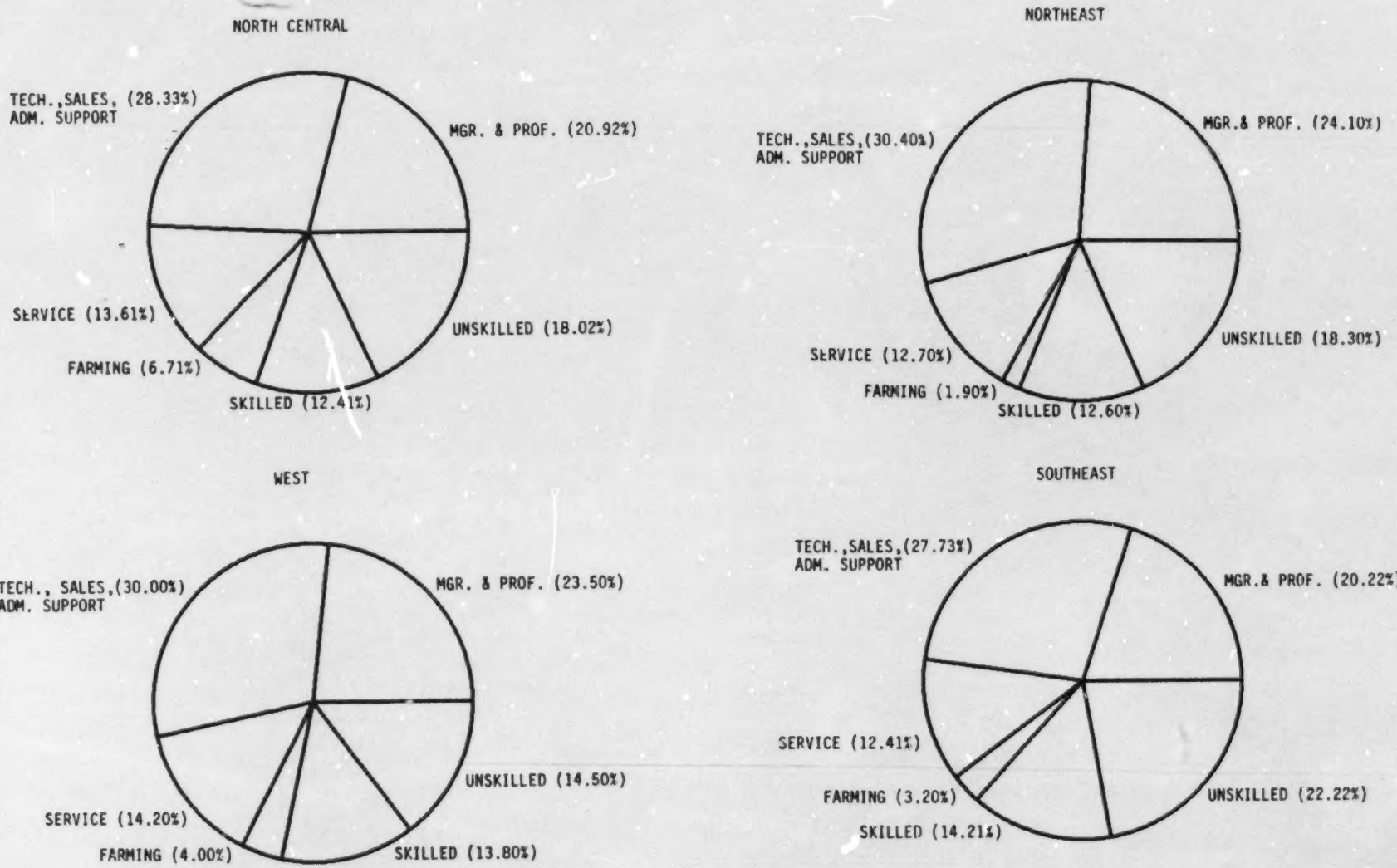

FIGURE 1: REGIONAL EMPLOYMENT BY OCCUPATION

anatomy of the cycle and the job of educators to implement curricula that lead, rather than lag, the occupational demands of a growing economic region.

The economic measures utilized to this point are static in nature; they represent cumulations of growth at a point in time. The collection and analysis at the state level of more measures of economic growth are beyond the scope of this preliminary study. Nevertheless, an indicator of growth, migration into the state, is readily available and provides some useful insights. Census data have been indicating for some time now that population is shifting to the "Sun Belt." Sociologists attribute this exodus to factors such as relatively hostile northern climates, overcrowding, and industrial pollution. Economists focus more on the hospitable economic climate of the South -- potential for economic growth, cheaper wages, lower unionization rates, lower taxes, and less restrictive local governments. The sociological magnets should affect the Southeast and Southwest comparably, while the economic draws should evidence themselves disproportionately in the region of greater economic growth.

Table 2 provides a broad impression of the regional migration pattern as reflected in the 1980 Census. The raw data represent the percentage of the 1979 state population who lived in another state in 1975. Note that only movements within the United States are included to avoid the bias from border states such as Florida and Texas. The table is constructed to highlight interregional migration by region of origin and destination. The most relevant set of statistics appears in the bottom row: "Total From Other Regions." Although the Southeast ranks second in total migration from other regions (5.3 percent), it is

substantially behind the West (8.9 percent). These figures suggest that the participants in the "Sun Belt" migration are more inclined to the Southwest. That is, an important portion of this movement appears to be economically motivated, and more of that economic growth appears to be taking place in the Southwest than in the Southeast.

Table 2

Percent of 1979 Population Living Outside of State in 1975

Region Lived In, 1975	Region Living In - 1979			
	Southeast	Northeast	North Central	West
South	5.0	2.1	1.8	3.5
Northeast	1.9	5.5	0.7	1.7
North Central	2.4	0.9	3.8	3.7
West	1.0	0.7	1.6	8.5
Total In-Migration	10.3	9.2	7.9	17.4
Total From Other Regions	5.3	3.7	4.1	8.9

With respect to future studies formalizing the links between local educational policy, economic growth, and migration, recent economic literature offers some guidelines and preliminary results. Richard Cebula concludes, based on migration patterns within thirty-nine metropolitan areas, that migration is positively related to differences in local spending on public education. Specifically, Cebula found that not only did growth of educational expenditure appear to strongly influence migration, but educational expenditure itself tended to rise as a result

of migration.[7] A subsequent study by Ostrosky found further evidence of this relationship and suggested that the methodology can be of use in forecasting.[8] The relevance of such research, if done specifically for the southeastern states, would be in planning additional education revenues resulting from economic growth and in-migration.

II. EQUITY AND FISCAL CAPACITY IN EDUCATIONAL REFORM

One of the most striking consistencies in the recent reports on educational reform is the commitment to equity. This pervasive notion is most succinctly expressed in The Paideia Proposal, "The best education for the best is the best education for all."[9] The same theme is boldly displayed in the opening of A Nation at Risk:

> All, regardless of race or class or economic status, are entitled to a fair chance and to the tools for developing their individual powers of mind and spirit to the utmost.[10]

And, as stated in Educating Americans for the 21st Century, the goal of the National Science Foundation is to:

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[7]Richard J. Cebula, "An Analysis of Migration Patterns and Local Government Policy Toward Public Education in the United States," Public Choice 32 (Winter 1977), pp. 113-121.

[8]Anthony Ostrosky, "A Further Note on Migration Patterns and local Government Policy Toward Public Education," Public Choice 34 4 (1979), pp. 505-507.

[9]Mortimer Jerome Adler, The Paideia Proposal. (New York: Macmillan Publishing Co., 1982), p. 6.

[10]National Commission on Excellence in Education, A Nation at Risk: The Imperative for Educational Reform. (Washington, D.C.: Government Printing Office, 1983), p. 4.

> . . . provide all the nation's youth with a level of education in mathematics, science and technology . . . that is not only the highest quality attained anywhere in the world but also reflects the particular and peculiar needs of our Nation.[11]

To the economist, such rhetorical commitments to equity in reform are likely to be at least as costly as they are commendable. Even so, a perusal of the reform literature reveals that little if any consideration has been given to the financial implications of what is clearly a major economic undertaking for national, state, and local authorities. It is noteworthy, and rather appalling, that of the forty commissioned papers that contributed to the recommendations contained in A Nation at Risk, not one deals explicitly with the costs of equitable educational reform.[12] In Action for Excellence, the issue of resources is at least mentioned, but hardly addressed -- "Our recommendation, in sum, is this: more funds, from all sources, for education."[13] The simple appeal for more resources is typical of the reform proposals. Indeed, there is an underlying presumption running through the reform literature that our society will be willing, must be willing, to spend whatever it takes.[14] This perception may be justified, but from an economic perspective, it

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[11]National Science Board Commission on Precollege Education in Mathematics, Science and Technology, Educating Americans for the 21st Century. (Washington, D.C.: National Science Foundation, 1983), p. 3.

[12]Op. Cit. A Nation at Risk, Appendix C, pp. 44-48.

[13]Task Force on Education for Economic Growth, Action for Excellence: A Comprehensive Plan to Improve Our Nation's Schools. (Education Commission of the States, 1983), p. 36.

[14]"Of all the tools at hand, the public's support for education is the most powerful." Op. Cit. A Nation at Risk, p. 16.

quantity of equitable educational reform without knowing something first about price and foregone alternatives. As Elchanan Cohn has observed, "Educational finance is probably the most controversial issue in the economics of education."[15] In sum, major public finance issues pervade the proffered educational reform aimed at economic growth. This section highlights economic issues pertaining to the federal, state, and local roles implied by equitable educational reform in the Southeast.

The Federal Role

As noted in Section I, according to the 1980 Census data the southeastern states as a whole have the lowest per capita income, the lowest per pupil expenditure, and the lowest average level of educational achievement in the nation. Combined, these facts suggest that the sweeping type of equity alluded to generally may not take place in the Southeast as a region without considerable infusion of federal funds representing a measure of redistribution from states outside the Southeast. Nor is the possibility of such redistribution entirely remote. A study of federal educational allocations by Guthrie and Lawton[16] concludes that significant redistribution does occur. Thus, the constituent states need to examine how resources can be effectively extracted from the federal coffers. Researchers need to investigate

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[15] Elchanan Cohn, The Economics of Education. (Cambridge: Ballinger Publishing Company, 1979), p. 257.

[16] J.W. Guthrie and S.B. Lawton, "The Distribution of Federal School Aid Funds," Educational Administration Quarterly 6 (Winter), pp. 47-61.

what characteristics mandate federal educational aid currently, and what sorts of legislative initiative, based on sound economic evidence, can improve the southeastern states' shares.

For example, the findings of Ginsberg and Killalea[17] suggest that federal educational aid tends to be oriented toward low-wealth/high-density areas to the detriment of areas of low district wealth per se. If this is true, the present allocation schemes may be biased against a significant part of the Southeast. While the Southeast clearly has areas of low wealth, our suspicion is that these are not also inordinately high density. Therefore, the Southeast may not receive the level of equalizing aid its native wealth position might otherwise warrant. Also, many federal programs require matching state or local funds. This, of course, is designed to ensure some commitment by the recipient constituency. At the same time, however, stipulations for matching funds may have regressive redistributional effects for the obvious reason that poorer states and localities may not have the same funds available to allocate toward matching federal programs. Finally, studies examining the extent that federal monies to the states of the Southeast have been "stimulative," rather than "dilutive" or substitutive," may assist in justifying an expanded federal funding role. All of these points can be investigated empirically and within a framework of sound economic theory.[18] In summary, under the populist

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[17] A.L. Ginsburg and J.M. Killalea, "Patterns of Federal Aid to School Districts," Journal of Education Finance 2 (Winter), pp. 380-95.

[18] Chapters 3 & 4 of Lee Friedman's recent book, Microeconomic Policy Analysis, provide an excellent theoretical foundation for these
(Footnote Continued)

banner of equity in educational reform, the Southeast needs to develop strategies, based on economic evidence, to secure more than its simple proration of federal educational dollars. Though federal funds currently represent a relatively small share of state budgets for primary and secondary education,[19] our a priori suspicion is that, of the additional dollars that must be committed to educational reform, the federal share in the Southeast will need to be expanded. Broadly speaking, the native wealth of the region seems incommensurate with the breadth and equity in reform which educators and legislators envision as mandatory.

State and Local Fiscal Capacity

The issues of equity and finance at the state and local level predate recent educational concerns by more than a decade. Court decisions such as Serrano vs. Priest have made it clear that the quality of a child's education should not be determined by the wealth of his/her neighborhood. On the other hand, local property taxes, and thus local wealth, have a significant impact on educational expenditure in almost every state. Despite the various state aid formulas designed to neutralize wealth discrepancies across local districts, the more popular

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(Footnote Continued)
issues. Also, a comprehensive review of empirical studies on the impact of federal grants on educational spending appears in Tsang and Levin, "The Impact of Intergovernmental Grants on Fducational Expenditure," Review of Educational Research, (Fall 1983), pp. 352-360.

[19] Nationally, the 1983 federal share in primary and secondary educational expenditure was 6.8 percent. Though relatively small, it is also noteworthy that this is a significantly larger share than the 3.9 percent contributed in 1960. (Source: 1983 Statistical Abstract. Table 211, p. 138.)

schemes such as foundation or district power equalization (DPE) formulas are imperfect. Regarding the DPE program in particular, Feldstein has demonstrated in clear, theoretical terms that the equalizing focus of DPE plans is misdirected.[20] Though the intent of DPE is to equate tax bases across localities and thus neutralize the role of neighborhood wealth in school appropriations, current DPE formulas actually alter both the districts' tax base and the price of education. Except under very restrictive conditions, DPE will simultaneously redistribute income away from high-wealth areas and raise the price of education in those localities.[21] The result is that DPE can leave the highest pre-equalizing-wealth localities with the lowest fiscal capacity because these areas end up facing the highest, postequalizing price of education. As an alternative, Feldstein demonstrates how the price of education to a locality can be adjusted to achieve the appropriate degree of wealth neutrality by use of a schedule of matching rates which vary inversely with district wealth.

Feldstein's model is a superior means for achieving wealth neutrality. However, implementation of such a program will have impacts that are either redistributive of state subsidies vis-a-vis DPE and foundation plans or imply a different state educational outlay. For this reason, we believe that states that are interested in estimating the cost of equitable educational reform investigate the expenditure and

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[20] This condition requires that both the wealth elasticity and price elasticity with respect to education be unity.

[21] M.S. Feldstein, "Wealth Neutrality and Local Choice in Public Education," American Economic Review, 65 1 (March 1975), pp. 75-89.

intrastate redistributional implications of a truly wealth-neutralizing plan such as Feldstein's. The financial implications of the Feldstein model have been examined empirically, a good example being the study by Gilmer and Morgan. They simulate the fiscal effects of imposing wealth-neutral educational finance in Texas. Their study is especially relevant to this report, for as the authors note:

> The Texas educational system is representative of the southern states in that (a) it employs a minimum foundation program, (b) it relies heavily on state government aid, and (c) substantial differences in fiscal capacity exist among its local school districts.[22]

States interested in how revised wealth-neutral funding will influence state and local fiscal positions should conduct their own simulations. In this way, policymakers can get a better perception of what the cost of equitable educational reforms may be in their state. One should not be surprised that this cost may be high and, further, that the foregone alternative may be more efficient educational reforms from the standpoint of growth.

The Corporate Role

Corporate investment represents a third and relatively untapped dimension for financing reforms in public education. The rationale for greater investment by the corporate sector is double-edged. First, according to Secretary of Education Terrell Bell, much of the $40 billion currently spent by firms for on-the-job training is to teach

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[22] Robert W. Gilmer and Daniel C. Morgan, Jr., "Wealth Neutral Grants for Public Education." Public Finance Quarterly 7 3 (July 1979), p. 272.

basic skills that public schools could or should be teaching. [23] Second, the present commitment of the corporate sector to primary and secondary education is remarkably shallow. According to the Council on Financial Aid to Education, "Corporations contributed a record $1.3 billion in gifts and equipment to education, but only 4 percent went to public and private elementary and secondary schools." [24]

III. EFFICIENCY CONSIDERATIONS IN EDUCATIONAL REFORM

The argument thus far has been that there is indeed a link between education and economic growth, but that 1) the linkage has not been adequately measured and that research must be done to define that connection; and 2) the elementary fact of scarce resources has been largely ignored in much of the literature on educational reform and economic growth. Sections I and II addressed the question of the linkage between education and growth and the question of the equitable allocation of resources. This section raises issues of economic efficiency.

In economic analysis efficiency refers to the optimum allocation of resources across a vast array of competing end uses. In many markets, the efficient solution is determined by myriad independent judgments, judgments of consumers and producers which are influenced and aligned by considerations of product prices and production costs. In the field of education, the notion of economic efficiency can be

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[23] Peter Brimelow, "What To Do About America's Schools," Fortune, September 19, 1983, p. 64.

[24] The Nation Responds, op. cit., p. 17.

considerably more complex. From an economic perspective, educational production is perhaps unique in that the students are at once three major components of the production process. Students are an important, though not necessarily homogeneous, input; they are a major producer of the product; and they are the product itself, consumed by both the individual and society. It is this type of intricacy that makes education a unique production phenomenon and, at the same time, a seemingly intractable technical process. Despite these complexities, two economic issues remain which are quite clear. First, students invest an immense amount of time and, occasionally, effort in education. The nature of this investment must be measured against the likely career return. In this respect, matters of curriculum, especially the appropriate mix of basic, accelerated, and vocational education, should be carefully evaluated. Is an efficient curriculum necessarily a narrow one? Broadly speaking, research needs to address the probable economic returns and costs of curricular reforms. Second, faculty and administrators represent another dimension of human investment. Furthermore, these factors in the production process carry rather well-defined input prices. As such, researchers need to examine strategies for improving efficiency in educational management. Generally, this section highlights research prospects within the context of what might be loosely regarded as the educational production function.

The Basics

It is easy to understand why interest in a return to the "basics" is widespread. The rapidly changing technology of today's economy, the

declining test scores of today's students, the difficulty of forecasting future labor force requirements -- all attest to the need to prepare students to function in a world of change.

While there is little reason to question the consensus on the need for a return to the basics, there are mostly unanswered (sometimes unraised) questions about the economics of such a move. Instead of saying that we must return to the basics as though resources are unlimited, it is proper to ask such questions as: What are the substantive changes that should be made in the curriculum? Which subjects should be changed and how? What kinds of mathematics are useful, and what aspects of reading should be emphasized? How much more teaching time is involved in raising the competence of students to some higher level?

The type of the research required to answer these questions is such that the disciplines of economics and education will both be relevant. Economists, qua economists, do not know much about the process of learning to read, to write, or to do mathematics. But the emphasis on efficient allocation of resources, which is the economist's contribution, seems to have been missing in much, if not all, of the research and policy decisions of the past.

This points to several research issues. First, studies should examine just what aspects of the new "Three R's" are going to be relevant in tomorrow's job markets. Interviews with executives in a number of industries suggest that the best "vocational" training may be a training which prepares students to read instructions, to draw inferences, to do a modest amount of mathematics; in short, to function in an information age. The Education Commission of the States has set

out curriculum goals which speak to this general point.[25] Further research on the relevance of curriculum to job markets of the future is essential.

Second, work should be done to examine the effectiveness of the teaching and learning process. A timeworn subject to be sure, this topic again illustrates the importance of basic strategies to allocate resources more efficiently, rather than simply in greater amounts (e.g., longer school days, more teacher input time, etc.) Two approaches to this topic are reviewed here.

First, resource allocations should be guided by the "elasticity of learning" (learning response measured in proportion to input of teacher time). Preliminary evidence indicates that these elasticities, though generally low, are highest for the earliest stages of learning. For example, the elasticity for second grade mathematics is .24, while that for fifth grade is less than .01; for beginning reading it is .13, and for advanced reading it is .07. This suggests a process of diminishing returns which can hardly be ignored in decisions to invest in teaching time.[26] For example, a tendency to invest more heavily in secondary rather than primary schools runs counter to these findings. Also, these findings suggest that differential weightings for average daily atten-

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[25]Task Force on Education for Economic Growth, Action for Excellence: A Comprehensive Plan to Improve Our Nation's Schools. (Education Commission of the States, June 1983), pp. 48-50.

[26]Byron W. Brown and Daniel H. Saks, "The Microeconomics of Schooling: How Does the Allocation of Time Affect Learning and What Does It Reveal About Teacher Proficiency?" Institute for Public Policy Studies, Vanderbilt University, (March 1984), p. 16. An elasticity of 0.25 means that a 1 percent increase in teacher input time results in a 0.25 percent increase in student learning.

dance which favor high school over the primary grades may require modification.

Second, an effort should be made to learn from recent experiments in model school programs. The so-called magnet schools might, at first glance, provide such an opportunity. However, there is some evidence that the effect of such schools has been mainly to redistribute gifted students from their regular home to the model schools. Whether more learning takes place and whether such methods could be transferred to the ordinary school situation is difficult to say. However, there are educational experiments, such as the one coming into place in Virginia, which are being developed on the basis of adding resources to a "typical" school and then measuring the effect of state-of-the-art methods and equipment. Such experiments offer the opportunity of studying the incremental effects brought about by changes in teaching methods, teaching personnel, capital-intensive teaching aids, changes in class size, and other dimensions of the educational process.

Vocational Education

The polar positions on this issue are easily identified. On the one hand, there is the view, exemplified by Mortimer Adler and the Paideia groups, that no vocational education whatsoever should be allowed in the curriculum. The opposing view is taken by professionals in the field of vocational education who argue for massive injection of funds in this direction.

The Adlerian view is twofold. First, Adler argues that "trained competence for a single type of work could be justified at the beginning

of this century when the needs of society differed from those served by apprenticeships in the era of guilds but that kind of training is no longer justified."[27] Second, he argues that with the productivity of modern economies, there is the opportunity for the development of the full faculties of the individual in an abundance of leisure time. Basic schooling should give the most general education so that young people will be equipped to adapt to change which will certainly be the hallmark of the work place of the future, and so that they can develop themselves to the fullest.

The views of Adler are not without foundation; empirical studies do indicate that there is a rapid "decay" in the incremental earnings associated with vocational training. Thus the rate of return (either private or social) to vocational training has been measured as very low.[28]

While these studies appear to be rather convincing, there are considerations which suggest that the role of vocational education needs more careful examination before it is abandoned. First, a point that is all too frequently ignored in these studies is one of finding an appropriate control group. It is entirely possible that many students actively involved in vocational programs would drop out of high school were these programs not available. In that case, the true benefit of

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[27]Mortimer Jerome Adler, The Paideia Proposal. (New York: Macmillan Publishing Company, 1982), p. 6.

[28]Comments by Dr. Daniel Saks and Dr. Eva Galambos at the Symposium of the Federal Reserve Bank of Atlanta, "The Relationship Between Education and Economic Growth and Productivity," (May, 1984).

vocational training would be keeping these students in school, thereby allowing them to get the jobs in the first place. That they earn no more after three years than high school graduates without comparable training is irrelevant. Indeed, Virginia's Henrico County School System reports marked success with a vocationally oriented program for students who cause problems in the classroom and eventually drop out. Rather than failing to learn reading, mathematics, geometry, and so forth through the traditional approach which is abstract to them, they eagerly (and perhaps unwittingly) learn the same tools through training manuals in an applied manner. Simply stated, the purely academic approach may not be the best approach for all high school students. Second, there is some experience to suggest that vocational training succeeds in lengthening student education even beyond high school. In the state of Virginia, a recent survey of high school vocational graduates found that over half of these students continued their education.[29] Third, there is the good possibility that vocational education can be improved by a better reading of labor market trends and faster adaptations of vocational curriculum to such trends. Research of this nature would address what some observers have cited as a major cause of structural unemployment, namely, the long time lag between the decision to pursue a course of study and the ensuing entry into the labor market.[30]

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[29] Richmond News Leader, (May 13, 1984), p. 13.

[30] Robert J. Gordon, Macroeconomics, Third Edition. (Little, Brown and Company, 1984), p. 338.

A recent issue of Fortune magazine addresses the role of vocational education in the United States and concludes that there is vast waste and inefficiency in this $ 6.7 billion program.[31] While concluding that the high schools would be well advised to concentrate almost exclusively on the basics, the article does point out several schools and several programs that are quite effective. This suggests that programs can be devised which will prepare students for successful placement in contemporary technical jobs, enforce a work ethic through early work experience, and serve to retain students in secondary schools.

Research at the National Center for Research in Vocational Education at Ohio State University currently offers a data base which may be useful in evaluating the broad issue of cost effectiveness in vocational education. With an adequate data base, research could be done that would provide a truer assessment of the rate of return on vocational education than has perhaps previously been done. Such research should attempt to assess the role of vocational programs in retaining and motivating students. It would give special attention to cooperative efforts of industry and education in developing programs that are oriented to successful career development.[32]

In sum, our position is that it is too facile a conclusion to argue that vocational education in the public schools is a wasteland. There

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[31]Gilbert T. Sewall, "Vocational Education That Works," Fortune, (September 19, 1983), p. 68.

[32]Henrico County, Virginia, "Public Schools: A Prospectus, 1983-84."

is evidence, perhaps fragmentary and often anecdotal, but evidence, nevertheless, that such programs can be effective, that a large number of students do not respond well to the elitist pre-college curriculum, but can be well served by vocational programs that combine academic rigor and practical job experience.

Counseling

Perhaps as important as the learning process itself and the knowledge and skills obtained in the school system, is an awareness on the part of students of career opportunities and an orientation to the advantages in the world of work that can accrue to the educated person. Interviews with executives in industry, government, and education indicate that the school system may not be doing an adequate job in this area.

There is the impression that counseling concentrates unduly on the college-bound student, and that the counseling system does not reach far enough down into the lower grades where attitude formation might include attention to job and career paths. The question to be asked, of course, is whether counseling should be tilted in these directions and, if so, to what extent would it be economically profitable to devote more resources to the task. Given the vast literature that has developed on counseling (including vocational and educational counseling), it may be too much to ask that much new research be accomplished in this area. A good beginning in this area might be that of a simple survey of a random sample of counseling systems in which two questions would be explored:

1) the proportion of time counselors in high school spend on college-bound students as compared with time spent on counseling all students in matters of job opportunities; and 2) the extent to which counseling for career paths reaches down to the lower grades.

Another dimension of counseling that has been suggested by some observers is the matter of the preparation of counselors, their own motivational characteristics, and their place in the organizational structure of the school system. Is there any evidence that counseling positions are considered to be rewards to individuals of ability, dedication, and motivation, or are these posts considered to be places where individuals are shunted aside?

Difficult to research as these topics may be, the basic point made above is that matching student abilities and motivation to the needs of the work place may be as important in economic growth as are the learning experiences of students in the classroom, shop, or laboratory.

Economics Education

The literature of economic growth and development has always recognized that one of the benefits of education, from the point of view of growth, is that of attitudinal change. That is, as individuals are brought into contact with new ideas as their capabilities increase, it is likely that they will be better disciplined, more innovative, more motivated, and, in general, more productive members of society.

The rationale for efforts to bring about a better understanding of economics among the young is that these young people will grow up to be better participants in the economy. One need not embrace the view that

the school system is a capitalist plot to capture the minds of the young to appreciate the potential impact of a citizenry which understands the workings of the market mechanism and the rewards that can flow to individuals and to society from a productive economy.

The Joint Council on Economic Education has, since its inception in 1949, made remarkable progress in the promotion of a better understanding of economics among teachers and students in the nation's schools. It has done so in ways that reflect a diversity of opinion, a respect for local autonomy, and a sensitivity for effective use of scarce resources. The JCEE has been notably successful in bringing a balanced and objective view to this subject. It must be admitted that the aim of this group is to further an appreciation for the market system. Obviously, in a different society, such aims would be different. In a recent feature article, Gary Thatcher of the Christian Science Monitor writes that, "The Soviet Union has just enacted one of the most far-reaching school reforms in history. Its specific aim is to help the nation's youth prepare for major technological changes during the rest of this century and into the next."[33] He cites such reforms as more highly trained teachers, 33 percent salary increases, improved textbooks, and a curriculum that will familiarize pupils with modern production with time spent in the work place. From the point of view of education in economics, the interesting quote is from Konstantin Chernenko, who said,

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[33]Gary Thatcher, "Soviet School Reform: Herculean Task," Christian Science Monitor, (April, 1984), p. 9.

"All the teaching process today should become, in a much greater measure than before, a vehicle of ideological content."[34]

In a statement in 1982 before the National Commission on Excellence in Education, the Joint Council made specific recommendations on the subject of education in economics. The relevant recommendations from the point of view of growth are: that the private sector continue to bear a significant portion of the cost of economic education; that no mass infusion of government funds be involved; that efforts be made to produce a set of guidelines that would be used throughout the United States as to what constitutes the subject of economics for the schools; and that a uniform teacher training effort in economics become a part of the nation's teacher training institutions.

One reasonable research goal for the future appears to be that of examining, possibly in cooperation with the Joint Council, the ways in which economics could be brought into every school district in the southeastern United States at some reasonable cost. The appealing thing about such research is that there is in place an organization equipped to bring its expertise and resources to bear on this research effort. In fact, eleven of the twelve states of the Southeast have a JCEE facility in place, and this organization estimates that on a budget of only $2.7 million they are able to reach 100,000 teachers a year.

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[34] Ibid., p. 11.

Faculty and Administrative Inputs

Common to all the recent reports on education in the United States is a concern for the quality of teaching and the quality of individuals being recruited into the profession. There is also some concern for the quality of administrative efforts.

The typical recommendations in this area are to suggest that more attention be paid to teacher evaluation, that teacher salaries be generally increased, that teachers somehow be accorded more respect, etc.

While there is, indeed, merit in giving some attention to teacher merit and to evaluation and to the need for higher salaries generally, there is some indication that these recommendations have not given adequate attention to the workings of the market mechanism. What these recommendations appear to overlook is the segmentation of the labor market for teachers. This suggests that the way to recruit and retain good teachers in the fields of teacher shortage is to follow the example of higher education and industry. Salaries of teachers in disciplines which face the lure of industry and government employment (e.g., mathematics and science) must reflect this fact.

What is needed is a study which would look at the possibilities for differential salary scales for different teacher backgrounds. Such a study would have to consider cost, teacher morale, and the opposition of teacher organizations. But two considerations should be paramount in the study -- economic efficacy and political feasibility. Consider these factors with regard to two alternative proposals, merit pay and across-the-board teachers raises. On the economic side, differential pay by subject and level uses the market to direct teachers to areas of

need. It eliminates the current paradox of a surplus of lower elementary education teachers coupled with a dearth of high school mathematics and science teachers. On the political side, it seems to be the most palatable of the three approaches. Its objectivity relative to the subjectivity and difficulty of determining merit should make it more agreeable to teachers. And its lower cost, relative to across-the-board raises (in the face of notable teacher surpluses), would certainly be more acceptable to the public at large.

There is an often-discussed trend in the management of education which also warrants investigation. This is the seemingly bloated bureaucracy within the public school system. A recent edition of Fortune magazine calls attention to the dramatic increase in administrative personnel relative to student enrollment and faculty size, noting a drop in the ratio of pupils per administrator from 523 in 1950 to 295 in 1980.[35] Educators sometimes attribute this increase in administrative personnel to a number of factors, such as increased government regulation and the demand for more "services" in student personnel areas.

In fact, this explanation is probably not misplaced. Schools today are a far cry from the one-room school house or Mark Hopkins' log. They are complex institutions, often the largest employer in the political jurisdiction, perhaps having a budget of millions of dollars and several thousand personnel. In the language of education, the research area is one of educational administration; in the language of economics, it is

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[35]Peter Brimelow, "What To Do About America's Schools," Fortune, (September 19, 1983), pp. 60-64.

that of the production function. In either case, what is required is a study of the optimal mix of teachers, administration, and capital in the form of buildings and equipment.

In this regard, the role of private business in the educational production function emerges as an important issue for research. The reference here is to things other than simply greater financial involvement. For example, changing vocational trends as they relate to curriculum design is an obvious area where the business community has an interest and insight. Also, principles of cost effectiveness and planning are common aspects of successful business administration that are possibly fungible in educational production. These items include long-range financial planning, business assessments of how economic variables affect school systems, and forecasts of long-term enrollments so as to maintain the appropriate balance between students, faculty, and administration. It seems that there is much that could be gained from tapping this experience and expertise in educational reform via a stronger partnership between schools and corporations. The job of the researcher is to determine how this cooperation can be brought about so that business efficiency might open new avenues for the idealism and creativity that have always been the aims of education.

IV. SUMMARY REMARKS

The purpose of this paper has been to introduce educators to the diverse economic issues that are implied by educational reform in general, with special emphasis on the relationship between education and economic growth in the Southeastern United States. To a great extent,

the organization of the paper springs from a reaction to much of the recent literature on educational reform. This literature transmits a tremendous zeal for the notion of educational reform, but includes little explicit economic analysis. As economists, we find this surprising since most of the policy recommendations contained therein are rife with economic implications. As such, our prime objective has been simply to identify the economic issues. Throughout, we have attempted to highlight important research directions and, in many cases, recommend promising methodologies. The research topics cited in this paper are reviewed below.

Modeling Education and Economic Growth

If there were only one more contribution that economists could make, perhaps it should be a theory of the linkages between education and growth. Historical correlations between educational attainment and per capita income reveal virtually nothing about the structure of this relationship. A theory of education and growth is necessary to guide policy initiatives. At the same time, one cannot overstate the complexity of this issue. Still, a reasonable and valuable undertaking for economic research is to delineate more clearly the anatomy of the occupational cycle which seems to characterize growth and requires rising minimum levels of education. In this way, administrators may be better equipped to implement curricula that lead, rather than lag, the occupational demands of a growing region.

Migration represents another dimension of a growing region, growth which is attracted from without rather than generated internally. Two

studies offer preliminary evidence that greater educational expenditure and in-migration are products of one another. Given that the Southeast as a region is gaining population, the individual states should examine how significantly current and future in-migration will influence the revenues and expenditures for primary and secondary education.

Equity and Fiscal Capacity

The consensus that educational reform be equitable has particularly deep implications for the Southeast. Though there are certainly exceptions among and within the states, the Southeast as a region is statistically less affluent and less educated. These facts imply that the region has a bigger educational job to do and less native wealth with which to do it. For this reason, federal assistance appears as an especially important funding source. At the same time, there is some evidence that federal funding criteria may be biased against areas where low wealth is also low density, the likely situation in the Southeast. Therefore, states need to investigate which characteristics mandate federal educational aid currently and what sorts of legislative initiatives, based on sound economic evidence, can improve the southeastern states' shares.

The notion of equitable educational reform also has major financial implications at the state and local level. Feldstein has clearly demonstrated that the various state aid formulas designed to neutralize wealth and expenditure discrepancies across districts are imperfect. For this reason, states that are interested in estimating the cost of equitable educational reform should also investigate the expenditure and

redistributional implications of Feldstein's wealth-neutralizing model. Prototypes for such studies currently exist.

Efficiency Considerations

Perhaps more than any other component of American society, education requires the combined efforts and interaction of diverse constituencies. Students, parents, teachers, administrators, businesses, and government are all involved in ways that make measurement and policy prescriptions difficult. However, these interdependencies make it even more important that education be cost-effective. This paper has considered, therefore, the questions of designing research that addresses this issue.

In terms of "what" should be taught and "how" it should be taught, this paper suggests that curriculum be keyed to forecasts of future job markets and that research on the effectiveness of the teaching and learning process be undertaken. Specifically, it is suggested that research on the sensitivity of learning to teacher time be explored for different grade levels and subjects. Additionally, information from "model" schools should be utilized to evaluate teaching methodology in "everyday" school settings. It is further argued that the role of vocational education be researched from the point of view of modernizing that curriculum and measuring its rate of return, with due consideration for the role of vocational education in student retention.

The issue of counseling is raised because of the importance of channeling student interest and motivation into preparation for productive careers. It is suggested that activities in this field be examined to determine whether undue attention is paid to the college-bound versus

other students and whether adequate attention is given to students in the lower grades.

Closely related to counseling is that of attitude formation about, and information on, the economy into which all students will enter. The recommendation in this paper is that the work of the Joint Council on Economic Education be reviewed and that plans be developed to expand on the excellent foundation already laid by this organization.

Finally, this paper considers the ways in which the inputs into the educational process can be most effectively recruited and employed. it is suggested that the use of market signals for teacher salaries be explored and that the role of planning and analysis be increased within the administrative structure, with special attention given to the role of the business community in this activity.

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